**Nithin Das, CWID: 10422784, Date: 10/31/19 Assignment W&A 4th Edition, Ch 6, Q 18, Page 318**

I pledge on my honor that I have not given or received any unauthorized assistance on this

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Signature: NITHIN DAS

Date: 10/31/2019

**Management Overview**

* **Problem Statement**

To use a binary model to determine which types of vehicles to produce and in what quantities, to maximize profit.

* **Data Sources**

Resources: Labor hours consumed by each vehicle type, profit contribution of each vehicle type, minimal production quantity for each vehicle type, Labor hour and Steel availabilities

Constraints: Production quantities >=Logical lower bounds

Production quantities <=Logical upper bounds

Resources used <= Resources available

* **Model Approach**
* Enter all the inputs in the spreadsheet
* Identify the changing cells, i.e. binary variable to represent whether to produce the vehicle or not and ‘Units Produced’.
* Enter random variable for ‘Units Produced’ and enter randomly 0-1 for ‘Produce at least minimum’
* Calculate ‘Profit’ as SUMPRODUCT of ‘Units Produced’ and ‘Profit Contribution/ unit’ for each vehicle type
* Use Solver to maximize the profit by entering constraints and using Simplex method
* Use one-way SolverTable to perform Sensitivity analysis
* **Solution**

Results:

The optimal profit value is $6409091

Sensitivity Analysis:



**Recommendation:**

The total profit will increase almost linearly, if we allocate more steel and labor hours.